Project Proposal for SE118 System Analysis and Design Sessional

Actors: Student, Admin
Use Cases: Login, Enroll in Courses, View Content, Take Quiz, Manage Courses, Manage Users

1. Problem Analysis and Motivation:

Adaptive E-Learning System (AELS) solves the major problems of traditional classroom and rigid e-learning systems by making education flexible, personalized, and accessible to all learners.

Key Problems with Traditional Systems:

- **One-size-fits-all approach** – Every student gets the same content, regardless of skill level or learning style.
- **No flexibility** – Fixed schedules and locations make learning difficult for working professionals and remote learners.
- **High costs** – Traditional education involves expenses like travel, textbooks, and classroom fees.
- **Outdated content** – Slow updates in books and materials leave learners with old information.
- **No progress tracking** – Students and teachers struggle to identify strengths and weaknesses.

How AELS Solves These Problems:

- **Learn Anywhere, Anytime:**
  - Access courses from home, work, or on the go—no need to travel to a classroom.
  - Study at your own pace, revisit difficult topics, or skip what you already know.
- **Engaging & Varied Learning Materials:**
  - Interactive videos, quizzes, and activities keep learning fun and effective.
  - Content updates instantly, so you always learn the latest information (great for fast-changing fields like tech and science).
- **Saves Money:**
  - No travel costs, physical books, or classroom fees—making education more affordable.
- **Personalized Learning Experience:**
  - The system adapts to your learning style, speed, and knowledge level.

  - Recommends lessons and quizzes based on your progress.
- **Track Your Progress:**
  - Get instant feedback on quizzes and assignments.
  - See which topics you've mastered and where you need improvement.

2. Literature Review:

The e-learning market is now very large, worth about $399 billion in 2023. But many online platforms still give the same lessons to all students, which makes 72% of learners unhappy because the courses are not personalized. Studies show that adaptive learning can help students remember 60% more and also reduce learning time by almost half. New technologies like artificial intelligence (AI), machine learning, and natural language processing (NLP) are making adaptive learning systems smarter and more useful. The Learning Experience Platform (LXP) market is also growing fast and may increase by 30% by 2025. In Asia-Pacific, e-learning is growing the fastest at 17% every year, and in Africa, mobile learning is becoming very popular. Case studies prove its success: Duolingo improved student results by 34%, Coursera doubled the number of students finishing courses, and Knewton reduced learning time by 50%. In Bangladesh, 10 Minute School, ACS, KhanAcademy is adding adaptive features like personalized quizzes and recommendations, which help students stay more engaged and learn better. Still, many problems exist: most systems cannot adjust for different speed, style, and content at the same time; vocational training is not well covered; and teachers often do not get strong real-time data to guide students. These points show that adaptive e-learning is very helpful but needs more improvement, and our Adaptive E-Learning System (AELS) can help solve these gaps with better personalization, accessibility, and teacher support.

3. Methodology:

A set of methods, practices, processes, techniques, procedures, and rules for development. Block diagram of **Adaptive E-Learning System** is given in figure 1.

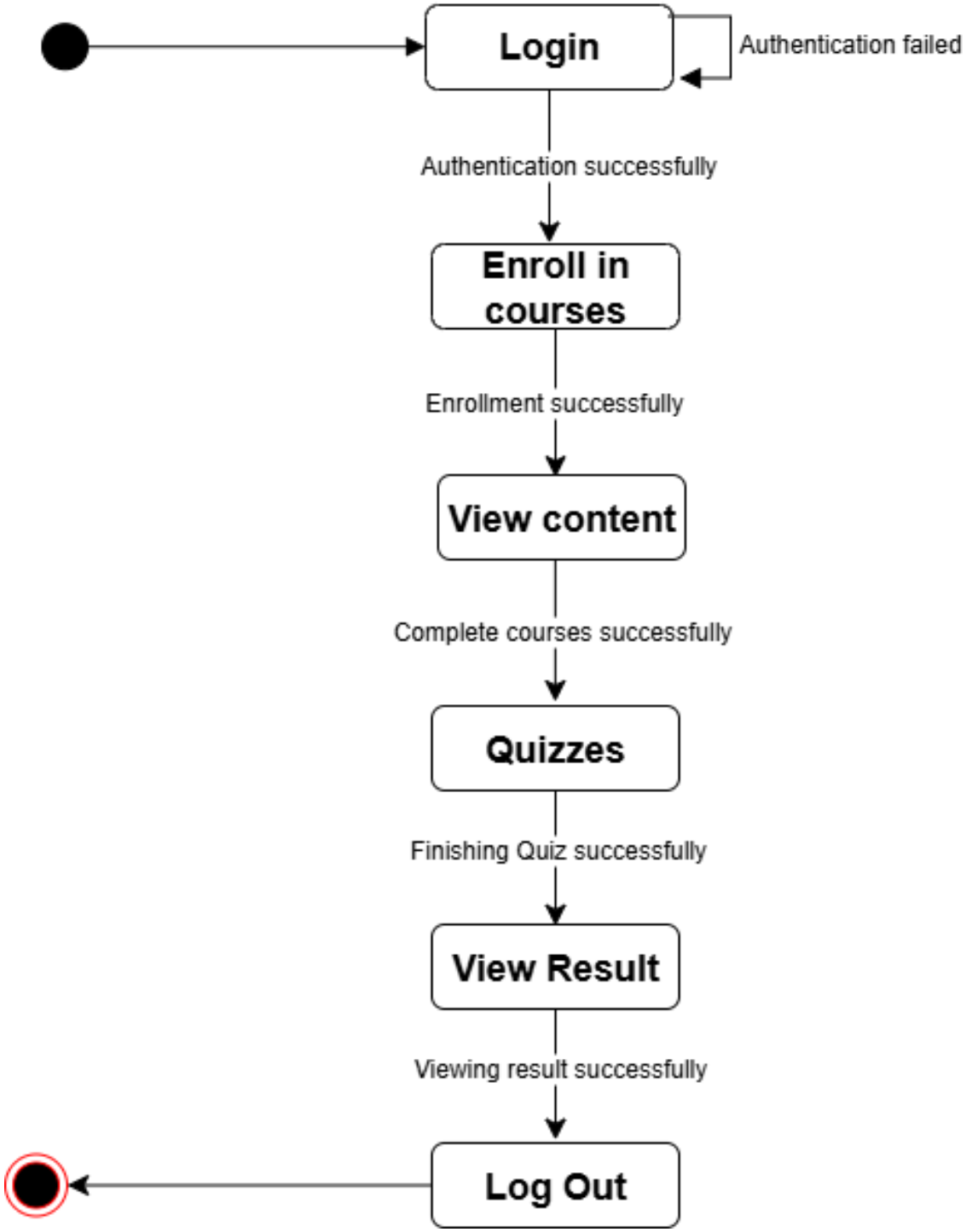

Figure 1: Enter Caption

Figure 2: Block Diagram of Adaptive E-Learning System

4. Feasibility Study:

Compare the proposed Adaptive E-Learning System (AELS) with traditional classroom and existing e-learning systems.

1. **Economic Feasibility:**
   (a) Estimated cost is 3,24,000 BDT.
   (b) It saves money for students, it reduces travel, books and classroom costs. Reasonable for a scalable e-learning.
   (c) enough staff are available for the project at a reasonable cost
2. **Technical Feasibility:**
   (a) The system will be built as a web/mobile app using simple and widely used technologies.
   (b) The team has the skills to design, code, and maintain it.
   (c) Servers, databases, and tools needed are available.
3. **Operational Feasibility:**
   (a) Easy to use for students and admins.
   (b) Adapts content to each learner's style and progress.
   (c) updates and support can be provided.
   (d) Manage time for classes

5. Main Phases:

- Project proposal and planning.
- Requirement specification of a project.
- SDLC selection for a specific project.
- Developing data flow diagram (DFD) model of a project.
- Develop UML use case diagram for the given project.
- Develop UML sequence and communication diagram for the given project.
- Develop UML class diagram for the given project.
- Software testing.

A demo project scheduling working plan in provided in table 1.

Table 1: Project Task Schedule for Adaptive E-Learning System

SL.	Task	Required Week	Responsible Person	Ph
1.	Requirement Specification and Data Collection	1	Project team members	Res
2.	Requirement Finalization	1	Project team members	Ana
3.	System Design and Modeling	2	Project team members	Des
4.	System Modeling and Finalization	1	Project team members	Des
5.	System Development (Coding)	2	Project team members	Imp
6.	Testing and Feedback Sharing	2	Project team members	Tes
7.	Beta Version Delivery for Feedback	2	Project team members	Tes
8.	Feedback Sharing and Requirement Change	2	Project team members	Tes
9.	Delivery Preparation with Documentation	1	Project team members	Dep

6. Gantt chart:

Work plan of the project (preferably a date inserted Gantt chart) Figure 2 provides.....

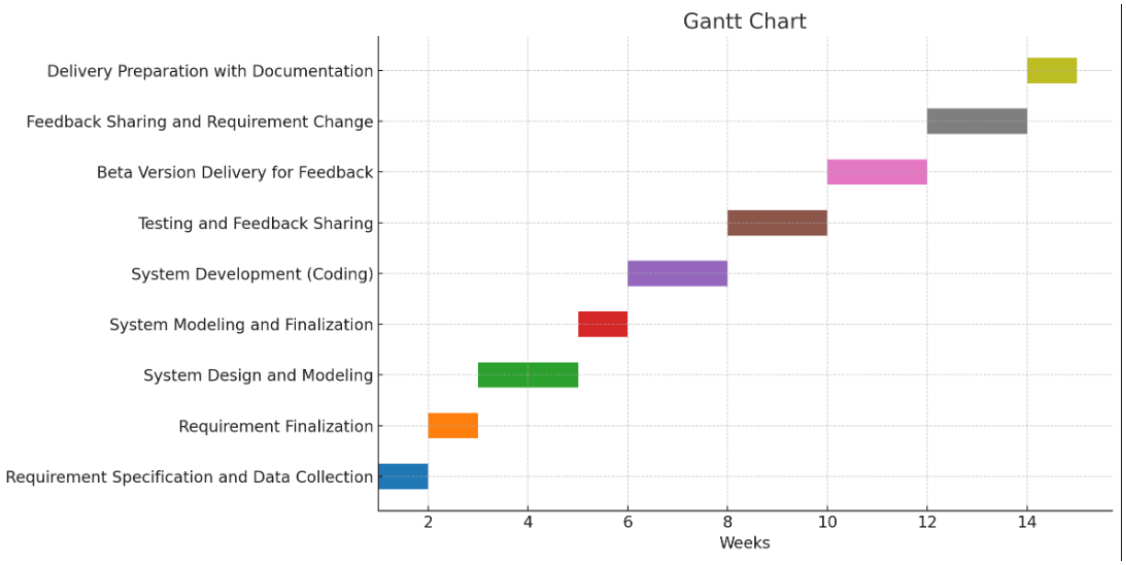

Figure 3: Project Development Timing

7. Budget Details:

Budget Details of an **Adaptive E-Learning System** Budget details are given in Table 2.

Table 2: Demo Budget Details of Adaptive E-Learning System

SL.	Item	Details	Estimated Cost(BDT
1.	Development Cost	Software design, coding, testing	1,44,000
2.	Domain & Hosting	1-year domain + cloud server	24,000
3.	Content Creation	Course videos, quizzes, materials	60,000
4.	Software Tools	Frameworks, APIs, plugins (open-source mostly)	12,000
5.	Training & Support	User training for admin & students	36,000
6.	Maintenance	Yearly system updates & bug fixes	48,000
7.		Total cost:	3,24,000

8. Conclusion:

1. **Efficient & Accessible Learning.**
2. **Interactive Course Management.**
3. **Easy Admin Control.**
4. **Improves Learning Experience.**

9. References: (IEEE Format Preferred):

1. "Comparative Review of Selected Adaptive e-Learning Platforms," *Int. J. Eng. Mod. Technol. (IJEMT)*, vol. 10, no. 5, pp. 103–129, 2024.
2. "The Use of Adaptive Learning Technologies in e-Learning for Inclusive Education: A Systematic Review," *E-Learning and Digital Media*, 2024.

Team Work:

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